

KOSHELEVA, I.M.; KUSAKOV, M.M.

Method of preparing and analyzing model well cores from quartz
sand. Trudy MNI no.14:167-183 '55. (MLRA 8:11)
(Geological modeling) (Oil well logging)

USSR/Chemical Technology - Chemical Products and Their Application. Treatment of
Natural Gases and Petroleum. Motor Fuels. Lubricants,
I-13

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 62631

Author: Kislinskiy, A. N., Kusakov, M. M.

Institution: None

Title: Instrument for the Characterization of the Temperature Dependence
of the Viscosity of Lubricating Oils

Original

Periodical: Zavodskaya laboratoriya, 1955, 21, No 1, 102-105

Abstract: There is proposed a new variant of the determination method using
the falling ball principle, which permits to obtain as a result of
a single experiment the curve of temperature dependence of the vis-
cosity of lubricating oil within a wide interval of low temperatures.
The determination is made by means of the cryoviscosimeter instru-
ment. In addition to determining the viscosity within the tempera-
ture interval from $\sim 20^{\circ}$ to the lowest, at which the oil loses the

Card 1/2

USSR/Chemical Technology - Chemical Products and Their Application. Treatment of
Natural Gases and Petroleum. Motor Fuels. Lubricants,
I-13

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 62631

Abstract: properties of a Newton's liquid, the instrument can be used to
determine the viscosity anomaly of the oil and the temperature
at which it arises, to determine the temperature dependence of
the so-called "apparent viscosity," and the dependence of static
shear stress upon temperature. The instrument can be used to
measure viscosity of both colorless and colored oils.

Card 2/2

KUSAKOV, M. M.

6

277. Investigation of the Interaction of Lubricating Oil
With Metals. Izledeniye vzaimodeystviya mazivnykh masel s metallami. (Russian.) G. M. Vinogradov, M. M. Kuskov,
I. S. Zolotarev, and E. A. Izrael'skiy. Trudy Akad. Nauk SSSR, v. 27, no. 9, Sept. 1977, p. 33-39.
Relation of wear to load, and amount of surface area in experiments. Types of lubricants for various loads. Graphs.

gm J.P. 008

KOTYAKHOV, Fedor Ivanovich, professor; KUSAKOV, M.M., redaktor; KOVALEVA, A.A., vedushchiy redaktor; POLOSINA, A.S., tekhnicheskii redaktor

[The physics of oil deposits] Osnovy fiziki nef'tianogo plasta.
Moskva, Gos. nauchno-tekhn. izd-vo nef'tianoi i gorno-toplivnoi
lit-ry, 1956. 363 p. (MLBA 9:8)
(Oil fields) (Petroleum geology)

SOV/124-58-2-2026

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 2, p 75 (USSR)

AUTHORS: Kusakov, M. M., Mekenitskaya, L. I.

TITLE: The Thickness of Thin Layers of "Fixed" Water (Tolshchina tonkikh sloyev "svyazannoy" vody)

PERIODICAL: V sb.: 4-y Mezhdunar. nef. kongress. Z. Moscow, Gostoptekhizdat, 1956, pp 261-271

ABSTRACT: Presentation of results of investigations relative to the thickness of liquid layers and their stability in the following systems: 1) A solid underlayer, a thin layer of water, and gas; 2) a solid underlayer, a thin layer of water, and a hydrocarbon liquid; 3) a solid underlayer, a thin layer of water, and petroleum. Quartz or glass served as the solid underlayer. The investigation comprised thin layers of aqueous solutions of electrolytes and various types of reservoir water. The thickness of the thin layers was determined by means of a measurement of their electrical conductivity. A thin layer was formed along the wall of a capillary, filled with the liquid under investigation, when an air bubble or a drop of hydrocarbon liquid or petroleum is introduced into the capillary. The

Card 1/2

SOV/124-58-2-2026

The Thickness of Thin Layers of "Fixed" Water

results of the investigations show that, depending on the combination of the adjacent phases, the thin layer can produce either a positive or a negative wedging effect. In the first instance it is positive and retains an equilibrium thickness over an indefinite time, whereas in the second case it is gradually displaced by the liquid contained in the drop introduced into the capillary. The realization of the one or the other effect depends on the ratio of surface tensions along the two boundaries of the thin layer. The influence of the composition of the electrolytes and the temperature on the thickness of the layer was investigated. Bibliography: 26 references.

S. V. Nerpin

Card 2/2

KUSAKOV, M. M.

Composition of the naphthene portion of the kerosene fraction of Tulumazinsk (Deranlan) crude oil. A. V. Topchiv, L. M. Rosenberg, M. M. Kusakov, and M. V. Shishkina (Petroleum Inst., Moscow). *Izvest. Akad. Nauk S.S.S.R. Khim. Nauk* 1956, 1109-19. --Ultraviolet spectrography of the aromatic hydrocarbons formed by dehydrogenation (Zelinskii, C.A. 6, 598) of the naphthene portion of the kerosene, showed that the kerosene contains meta and para isomers of alkylcyclohexanes, including monoalkyl branched deriva., as well as trialkylcyclohexanes with side chains in the 1,3,5- and 1,2,4-positions. Among the tetraalkylcyclohexanes 1,2,3,4- and 1,2,3,5-distributions predominate. The presence of penta- and hexaalkylcyclohexanes is not excluded by this work. The kerosene contains also dihydroacenaphthene, and decahydronaphthalene and its homologs, but dicyclohexyl is absent. G. M. K.

VINOGRADOV, G.V.; KUSAKOV, M.M.; BEZBORODKO, M.D.; PAVLOVSKAYA, N.T.;
ZELENSKIY, V.D.; KREYN, S.M.; BOROVAYA, M.S.

Wear-preventive properties of petroleum oils. Khim.i tekhn.tepl.
no.1:61-3 of cover Ja '56. (MLRA 9:7)
(Petroleum)

KUSAKOV, M. M.

The mechanism of additive action by the use of labelled organic thiophosphites. G. V. Vinogradov, M. M. Kusakov, P. I. Sanin, Yu. S. Zashchagin, E. A. Kazimirovskaya, N. V. Ivanova, and D. V. Rykova. *Khim. i Tekhnol. Toplen* 1956, No. 6, 11-20. The complex from the reaction of BuBr (0.6 mole) and S^{32} (CH_3NH_2 , 0.76 mole) in 44 ml. 85% EtOH after treatment with 1% aq. NaOH yielded 28.81 g. 1-butanethiol. I was the product of $S^{32} \pm 4.3 \times 10^4$ impulses min. g. The activity of the product (thiophosphite (II)) was prepd. in 4.8 g. from 1.02 mole and PCl_3 (0.054 mole) in 34.81 ml. benzene. The activity of II was 4.03×10^4 impulses min. g. The P^{32} -labelled tributylphosphite (III) (4.7×10^4 impulses min. g.) was prepd. in an analogous way by using P^{32} . These additives were dissolved in the naphthalene-paraffin oil MC-20. Disks (15 mm. in diam. and 1.5 mm. thick) made of stainless steel 30 KhGSA and electrolytic Cu were attached to glass holders and submerged in 2.5 g. of a soln. of II and III, resp., for 2 hrs. The effect of time and temp. on the amt. of P^{32} and S^{32} deposited on the metal surfaces was measured by β -emission. Increasing the temp. increased the amt. of both elements on the steel, with a max. deposit contg. P^{32} 4 and S^{32} 0.02% of the total amt. in the soln. at 160°. Above this temp., the radioactivity of the disks sharply decreased. This confirmed the earlier observations (V. et al., *Vestnik Akad. Nauk S.S.S.R.* 25, No. 9, 35 (1935)) that interaction of the elements in the additives and metals is chem. in nature. When the disks were treated first with unlabelled tributylphosphite and then with II, there was a 2-fold decrease in the radioactivity, indicating that the formation of a protective phosphite coating hindered the formation of oxide. The amt. of reacted isotopes as a function of time was measured at 20, 40, 60, 70, and 150°. After about 60 min. the rate of reaction of P^{32} with steel at 50° reached a const. value of 0.75 μ /sq. cm. Cu was found also to be an acceptor of P^{32} and S^{32} though much more reactive.

A. P. Kostikov

KUSAKOV, M. M.

USSR/Chemical Technology. Chemical Products and Their I-14
Application--Treatment of natural gases and
petroleum. Motor fuels. Lubricants

Abs Jour: Ref Zhur-Khimiya, No 3, 1957, 9272

Author : Kusakov, M. M. and Panov, V. V.

Inst : Academy of Sciences USSR

Title : Study of the Composition of Petroleum and Petro-
leum Products and Methods for Its Determination
(All-Union Conference)

Orig Pub: Vestn AN SSSR, 1956, No 6, 130-133

Abstract: A survey of the reports and transactions of the
All-Union Conference convened by the Academy of
Sciences USSR and the Ministry of Petroleum
Industry held in Moscow on 16-20 January 1956.
The conference dealt with the study of the com-
position and properties of petroleum, light
petroleum products, lubricating oils, and the
high-polymer constituents of petroleum as well as

Card 1/2

USSR/Chemical Technology. Chemical Products and Their I-14
Application--Treatment of natural gases and
petroleum. Motor fuels. Lubricants

Abs Jour: Ref Zhuk-Khimiya, no 3, 1957, 9272

Abstract: with the development of methods for their inves-
tigation and determination and the further
development of present work along these lines.

Card 2/2

7
 Determination of the interfacial tension of crude oils and water. M. M. Kuzakov and I. M. Kuchelova. *Trudy Nef. Inst. im. G. I. Gubkina* 1956, No. 16, 52-8. The interfacial tension (σ) of Zybask, Kokattinsk, H'sk, and Radaevsk crude oils and water was detd. at 20-50° by the following methods: max. bubble pressure, drop-wt., and the sessile drop. The H'sk oil was tested in contact with distd. water, the others in contact with connate waters. The accuracy of results obtained by different methods was within 3% for values in the range of 50 erg/sec. cm. and within 6% for values in the range of 5 erg/sec. cm. It decreased with an increase in temp., with exception of the Kokattinsk oil, which did not show any change with temp.

T. Durbak

Kusakov, M. M.

Thickness of thin films in contact with water. M. 57
Krynitzky and L. T. Mikhaylov. Prudy Nefi. Inst. im
G. I. Gubkina 1955, No. 10, 39-57. A study was made of
the following liquid layers: oil-soluble, thin films of
quartz; oil-soluble, thin films of quartz; oil-soluble, thin
films of quartz. The method of measurement of the thickness
of the thin films was described. The results of the measurements
on electric measurements of the thickness of the thin films
resistance of all systems was described. The results of the
conditions in which capacity and resistance of the thin films
be disregarded. The determination of the thickness of the thin
oil-soluble, thin films of quartz at the boundary with water
the layer formed at the boundary with water-soluble thin films
with thin liquid hydrocarbons. Because the results of the experiments

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KUSAKI/K.M. MEKENTS...

layer with concn. of electrolyte shows that thickness of the layer sharply decreases with increasing concn. in the range of small concns. and is considerably smaller in the range of high concns. of electrolyte. In the formation of the thin layer of aq. solns. between liquid hydrocarbon surface (C₁₂H₂₆) and glass, the thickness of this layer decreases with time, is less at higher than at lower temps., and the displacement of the layer does not depend on temp., and increases somewhat with increased valence of cation. Concn. of electrolyte influences time of existence of the layer: with high concns. of electrolyte...

3
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somewhat with increasing temperature and increasing concentration of electrolyte. The time of existence of the layer, with high concns. of electrolyte the layer is quickly displaced and with solns. of lower concn. the layer is displaced with difficulty. In order to det. the thickness of the aq. layer in the zone of capillary gas-bearing pores of the collector, the thicknesses of the thin layers of different "brines," confined with air on one side and quartz on the other, were detd. Samples of "brines" from various Russian deposits were studied, and a desolvation activity of the salt ions occurring in the brine was indicated; the av. thickness of the thin layer of brine on the boundary with air (in the case where the layer exists) is about 8×10^{-4} cm. On the basis of exper. data the hypothesis can be made that in the majority of cases the water may not be in the form of a flattened film overlaying the canal-wall pores of the collector and that petroleum comes into contact with the surface of the rock. The film of water may cover the canal-wall pores even in cases of low surface tension of water on the boundary with oil. In gas-bearing collectors the film of water may exist in a slightly mineralized form.

KUSAKOV, M.M., doktor khimicheskikh nauk; PANOV, V.V., kandidat tekhnicheskikh nauk.

Methods of studying the composition of petroleum and petroleum products (all-Union conference). Vest.AN SSSR 26 no.6:130-133 Jo '56.(MLZA 9:9) (Petroleum)

Kusakov, M.M.

481

2

Pressure effects on the viscosity and the structure formation of lubricants with additives. M. M. Kusakov and L. A. Konovalova. *Doklady Akad. Nauk SSSR*, 106, 552-3 (1980). The effects of depressor additives and of polyfunctional additives to lubricating oils on their viscosity and their structure formation were studied in a high-pressure viscometer (Zolotikh, *Trudy Morbov. Gosdars. Inst. Mest. i Ismeritelnykh. Priborov* 1, 37 (1980)) under pressures reaching 6000 kg./sq. cm. Up to 50° and at pressures up to 300 kg./sq. cm., the reciprocal of the viscosity piezocoeff. is a linear temp. function. The viscosity anomalies at 30° with paraffin addn. to the lubricating oil became noticeable at 1200 kg./sq. cm. pressures, and became greater at higher pressures. The paraffin sol. in oil is lowered by pressure, and the depressor effect, studied in detail at low temps., is similar to the pressure effect, although at low temp. it is caused by the intensity drop of heat motion, and at high pressure by a reduction in free vol. W. M. Sternberg

4-M 2251

KUSAKOV, M. M.

✓ The thickness of multimolecular layers of aqueous electrolyte solutions on glass or quartz in contact with air. M. M. Kusakov and L. I. Mekensitskaya (I. M. Gubkin Petroleum Institute, Moscow). *Doklady Akad. Nauk S.S.S.R.* 167, 153-7 (1958). The thickness of layers of aq. electrolyte solns. on glass or quartz in contact with air or hydrocarbon liquids was measured by detg. the elec. resistance of the thin cylindrical layer between an air bubble or a drop of the liquid (cf. following abstr.) and the inner surface of a glass or quartz capillary tube filled with the soln. An a.c. bridge was used under such conditions that the capacity and the induction resistance could be neglected. KCl, BaCl₂, and AlCl₃ solns., 0.01-1 M were used, and the surface cond. could be disregarded. Preliminary tests showed that at 400-6000 cycles/sec. and 20-100 v., the length of the air bubble did not affect the layer-thickness measurements. The thickness decreased with increasing temp., and it even became zero at sufficiently high temps., and it decreases with the cation valency in the order KCl, BaCl₂, AlCl₃. Layer-thickness detns. in rock interstices showed that strongly mineralized waters formed an equil. wetting films, whereas weakly mineralized waters, basic in reaction, do form such films, of around 5×10^{-4} cm. in thickness.

W. M. Sternberg

2

5

PM 227

KUSAKOV, M.M.

USSR, Physical Chemistry - Surface Phenomena. Adsorption.
Chromatography. Ion Exchange

B-13

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 3990

Author : Kusakov M.M., Mekonitskaya L.I.

Inst : Academy of Sciences USSR

Title : Experimental Investigation of Thickness of Polymolecular
Layers of Aqueous Solutions of Electrolytes on Glass and
Quartz at the Boundary with a Hydrocarbon Liquid

Orig Pub : Dokl. AN SSSR, 1956, 107, No 5, 715-718

Abstract : As a continuation of previous work (RZhKhim, 1956, 77760)
an investigation is made of the decrease in thickness
and subsequent disintegration of thin layers of aqueous
solutions of $AlCl_3$ and KCl of different concentration,
located between the wall of the capillary and heptane
(or a solution of a surface active compound in heptane).
Kinetics of this process is studied and the conditions

Card 1/2

- 222 -

KUSAKOV, M.M., prof., otvetstvennyy redaktor; PLATE, A.F., prof., otvetstvennyy redaktor; NIKOLAYEVA, V.G., kand.tekhn.nauk, otvetstvennyy redaktor; TOPCHIYEV, A.V., akademik, redaktor; KAZANSKIY, B.A., akademik, redaktor; SERGIYENKO, S.R., prof., redaktor; NEKRASOV, A.S., redaktor izdatel'stva; LOKTEV, S.M., redaktor izdatel'stva; NOVICHKOVA, N.D., tekhnicheskiiy redaktor.

[Composition and properties of petroleum and gasoline-kerosene fractions; a collection of papers on the study of the composition of petroleum and petroleum products] Sostav i svoistva neftei i benzino-kerosinovykh fraktsii; sbornik rabot po izucheniiu sostava i svoistv neftei i nefteproduktov. Moskva, Izd-vo Akad.nauk SSSR, 1957. 518 p. (MIRA 10:11)

1. Akademiya nauk SSSR. Institut nefti.
(Petroleum)

KUSAKOV, M.M.

PRIKHOT'KO, N F

24(7)

13

PHASE I BOOK EXPLOITATION 807/1365

L'vov. Universitet

Materialy I Vsesoyuznogo soveshchaniya po spektroskopii. t. 1: Molekulyarnaya spektroskopiya (Papers of the 10th All-Union Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy) [L'vov] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies printed. (Series: Its: Pizichnyy sbirnyk, vyp. 3/8/)

Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po spektroskopii. Ed.: Jaser, S.L.; Tech. Ed.: Saranyuk, T.V.; Editorial Board: Lapidberg, G.S., Academician (Resp. Ed., Deceased), Neporent, B.S., Doctor of Physical and Mathematical Sciences, Pabelinskiy, I.L., Doctor of Physical and Mathematical Sciences, Yabrizhskiy, V.A., Doctor of Physical and Mathematical Sciences, Kornitavits, V.G., Candidate of Technical Sciences, Nayakiy, S.M., Candidate of Physical and Mathematical Sciences, Klimovskiy, L.K., Candidate of Physical and Mathematical Sciences, Miliyanchuk, V.S., Candidate of Physical and Mathematical Sciences, and Gieuberman, A. Ye., Candidate of Physical and Mathematical Sciences.

Card 1/30

Goriadze, G.S. Anharmonicity of the Potential Curve of a Hydrogen Molecule

317

Kusakov, M.M., S.S. Mifontova, Ye. S. Pokrovskaya, et al. Study of the Structural-group Composition of Kerosene Fractions by Means of the Absorption Spectra in the Near Ultraviolet Region

321

Iogansen, A.V. Structural-group Analysis of Saturated Petroleum Products by Means of Infrared Absorption Spectra. Determination of CH_3 -groups, Aliphatic CH_2 -groups and Long Chains, $(\text{CH}_2)_n$

327

Gal'pern, G.D., A.N. Kielinskiy, I.A. Misayev, et al. Study of the Composition of Benzene-ligroin Fractions by Means of Combined Dispersion Spectra

329

Gal'pern, G.D., M.M. Kusakov, Ye. S. Pokrovskaya, et al. Study of the Absorption Spectra of Some Petroleum Aromatic Hydrocarbons in the Near Ultraviolet and Infra-red Regions

333

Card 21/30

KUSAKOV, M.M.; NIFONTOVA, S.S.; POKROVSKAYA, Ye.S.; ROZENBERG, L.M.;
TOPCHIEV, A.V.; SHISHKINA, M.V.

Absorption spectrum study in the near ultraviolet region of the
structure and group composition of the kerosene fraction. Fiz.
sbor. no.3:321-326 '57. (MIRA 11:8)

1. Institut nefti AN SSSR.
(Kerosene—Spectra)

KUSAKOV, M.M.; NIFONTOVA, S.S.; POKROVSKAYA, Ye.S.; ROZENBERG, L.M.;
TOPCHYEV, A.V.; SHISHKINA, M.V.

Absorption spectrum study in the near ultraviolet region of the
structure and group composition of the kerosene fraction. Fiz.
sbor. no.3:321-326 '57. (MIRA 11:8)

1. Institut nefti AN SSSR.
(Kerosene—Spectra)

AUTHOR: Kusakov, M.M., Konovalova L.A. and Avdeyeva, V.I.
65-4-6/12
TITLE: The influence of pressure on the viscosity of solutions of some silicon-organic liquids in a mineral oil. (Vliyanie davleniya na vyazkost' rastvorov nekotorykh kremniyorganicheskikh zhidkostey v mineral'nom masle.)

PERIODICAL: "Khimiya i Tekhnologiya Topлива i Masel" (Chemistry and Technology of Fuels and Lubricants) 1957, No. 4, pp. 38-41 (USSR)

ABSTRACT: The dependence of the viscosity of some solutions of polysiloxanes in a mineral oil on pressure at various temperatures was investigated. The viscosity measurements at pressures up to 3 000 kg/cm² and temperatures from 10 to 50 °C were carried out in a high pressure viscosimeter based on the principle of falling sphere (14,6). The dependence of the relative viscosity of oil AY, ethylpolysiloxane liquid and their mixtures on pressure is shown in Fig. 1., isobars of the concentration - relative viscosity relationship, in Figs. 2-4. The influence of some individual liquids with siloxane links (bis-pentaalkyl-disilane methane oxides with various radicals, from CH₃ to C₄H₉) on the viscosity of oil AY under the same pressures and temperatures was studied in some detail. Comparatively small concentrations (up to 0.5 mol/l 000) of the above compounds dissolved in AY oil decrease the relative

Card 1/2

The influence of pressure on the viscosity of solutions of some silicon-organic liquids in a mineral oil. (Cont.) 65-4-6/12

viscosity $\frac{\eta_p}{\eta_0}$ of solutions below that of oil AY. The effect

of their action increases with increasing pressure. Of the compounds tested those with butyl and ethyl radicals are more effective than those with methyl and propyl radicals. There are 4 figures and 8 references, including 5 Slavic.

ASSOCIATION: Petroleum Institute, Ac.Sc., U.S.S.R.
(Institut Nefti AN SSSR)

AVAILABLE:

Card 2/2

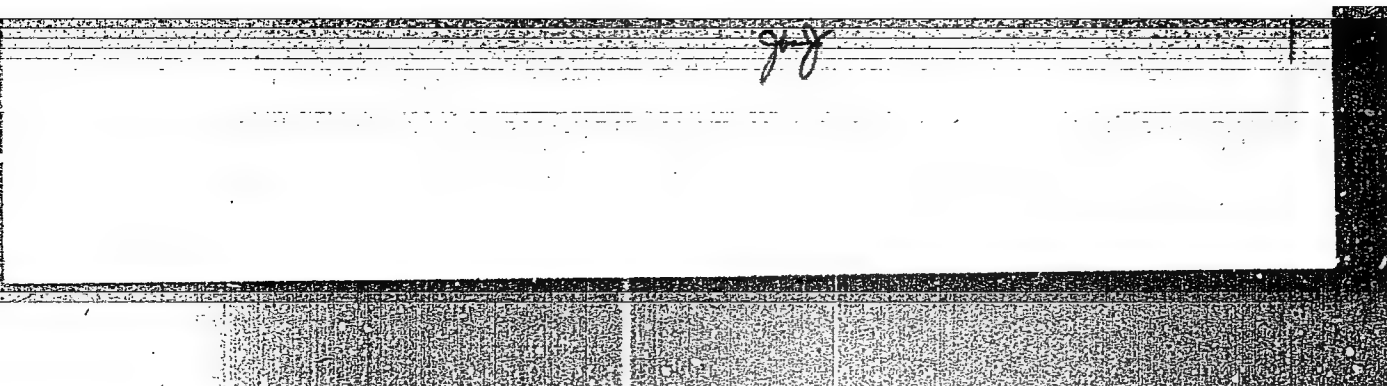
Kusakov, M. M.

Effect of pressure and temperature on the wetting of the
surface of quartz by petroleum and water. *Izv. Akad. Nauk SSSR*
and M. M. Kusakov. *Izv. Akad. Nauk SSSR* 1957, No. 4, 47-50 (in Russian). The experiments were
made in a special app. at 20-100° and from 1 to 350 atm.
cm. pressure. The contact angle θ at the interface be-
tween quartz and petroleum, a soln. of petroleum in water
dist. H₂O, sea H₂O, and H₂O satd. with N₂ and O₂, was
measured below layers of petroleum and measured.

3

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KUSAKOV M.M.
TOPCHIEV, A.V.; KUSAKOV, M.M.; NIFONTOVA, S.S.; SUCHKOVA, A.A.; SHISHKINA,
M.V.

Investigating condensed aromatic hydrocarbons from the kerosene
fraction of Romashkino oil. Khim. i tekhn. topl. i masel no.9:1-7
S. '57. (MIRA 10:11)

- 1. Institut nefti AN SSSR.
(Chkalov Province--Petroleum) (Hydrocarbons--Analysis)

MEKENITSKAYA, L.I.; KUSAKOV, M.M.

The state of bound water in an oil collecting stratum. Neft. khoz.
35 no.9:41-44 3 '57. (MIRA 11:1)

(Water, Underground)

Translated, M.M.
APPROVED FOR RELEASE: 03/13/2001

CIA-RDP86-00513R000927820008

20-5-25/54

AUTHOR: Kusakov, M. M. and Mekenitskaya, L. I.

TITLE: The Film and Capillary-Held Water in a Porous Medium
(Plenochhnaya i kapillyarno - uderzhannaya voda v poristoy srede)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol. 115, Nr 5, pp. 942-945
(USSR)

ABSTRACT: In 4 previous works by the same authors the thickness of the poly-molecular layers of electrolytic water solutions on the inner surface of a single capillary at various dividing boundaries was studied. These properties were studied in mineral gas- and mineral oil containing layers on samples of quartz sandstone of the Tuymaz oilfield in order to find out to what extent the conclusion concerning thin layers in single capillaries held for porous milieus and/ or can serve for the characterization of the state of bound water in mineral gas and mineral oil containing zones of a mineral oil collector. It was proved on this occasion that the method of water displacement from the cores though a little permeable dividing wall can be used for this characterization. If distilled water is used as rest water, it is in the

The Film and Capillary-Held Water in a Porous Medium 20-5-25/54

cores not only in a capillary-held, but in a film state, for distilled water can exist on glass and on quartz on the boundary with gas in form of balanced, moistening, thin layers. Fig. 1 shows the results of investigations of NaCl concentration with respect to the remaining water saturation (expressed in % of the pore volume), for 3 cores of different permeability. From the diagram (fig. 1) it may be seen that with the increase of NaCl concentration the quantity of the liquid remaining in the core decreases. Figure 2 shows curves which express the dependence of the remaining water saturation for distilled water and for 5 N-NaCl solution on the permeability of the core. Herefrom it may be seen that with a permeability of a porous milieu of 800 - 100 mda and more the quantity of the remaining liquid is independent of the permeability. From table 1 it may be seen that the quantity of capillary held liquid in the porous medium is practically independent of the nature of the electrolyte. The average film thickness of the distilled water "h" can be estimated from the difference between the total quantity in the cores of the capillary held liquids and the size of the specific core surface. Figure 3 shows the dependence of the average water film thickness (distilled) in the porous medium on the value σ/r , which is

Card 2/4

20-5-25/54

The Film and Capillary-Held Water in a Porous Medium

proportional to the expansive pressure of a cylindrical fine layer. This shows that also in this milieu the average layer thickness, conditions otherwise being equal, is determined by their expansive pressure. The remaining saturation is, in the case of trivalent salt solutions ($AlCl_3$) and relatively low concentrations for their same values, lower than in the case of univalent ones ($NaCl$). Apparently the thickness of the layers in $AlCl_3$ solutions is less than that in $NaCl$ solutions. At high concentrations practically no difference was observed in this respect, which might be explained by a complete destruction of the layers of moisturing at high concentrations. The above results mention the fact that the properties of fine layers such as were studied at the single capillaries on the boundary air / aqueous electrolyte solution / glass or / quartz, are fully conserved also in porous media. Consequently, the previously drawn conclusion is correct, i.e. that the state of bound water, particularly is gas, containing collectors, which represents electrolyte solutions, is determined by the physical-chemical properties of the liquid. There are 3 figures, 1 table, and 11 Slavic references.

Card 3/4

20-5-25/54

The Film and Capillary-Held Water in a Porous Medium

ASSOCIATION: Moscow Petroleum Institute imeni I.M. Gubkin
(Moskovskiy neftyanoy institut im. I.M. Gubkina)

PRESENTED BY: A.V. Topchiyev, Academician, February 13, 1957

SUBMITTED: February 11, 1957

AVAILABLE: Library of Congress

Card 4/4

AUSAKOV, M.M.

AUTHORS: Kusakov, M. M., Petrov, A. A.

20-4-30/51

TITLE: Note on the Rheologic Properties of Surface Layers at the Oil-Water Interface and Their Role in the Stability of Oil Emulsions (Reologicheskiye svoystva poverkhnostnykh sloev na granitse razdela نفت'-voda i ikh rol' v ustoychivosti neftyanykh emul'siy).

PERIODICAL: Doklady AN SSSR, 1957, Vol. 116, Nr. 4, pp. 637-640 (USSR)

ABSTRACT: The authors employed an apparatus of the type of a torsion pendulum for the purpose of studying these rheologic properties. According to the composition of the hydron-carbon phase and of the water phase, of the time of formation of the layer and its temperature three types of motion of the torsion pendulum can be distinguished. a) Damped oscillations, b) An aperiodic motion, c) an elastic-viscous motion. The most exhaustive data on the character of the rheologic properties of the surface layers can be obtained from the observation of the elastic-viscous motion of the torsion pendulum. A diagram illustrates the typical curves of the temporal development of the deformation of the surface layers at the interface between

Card 1/3

Note on the Rheologic Properties of Surface Layers at the Oil-Water Interface and Their Role in the Stability of Oil Emulsions 20-4-30/51

petroleum and water at a varying torsionmoment. The deformation of these surface layers develops in a way analogous to the deformation in the adsorption layers of saponine. Such types of curves of deformation over time can be caused by three types of deformations, instantaneous elastic deformations, deformation caused by elastic after-effects and an irreversible deformation of flow. Then the quantities characterizing the rheologic quantities are enumerated. For the purpose of investigating the influence of the nature of the petroleum on the properties of the surface layers, the rheologic properties of the surface layers on the interface were examined with a 15 % solution of NaCl (pH 6,3 -7,0) with different kinds of petroleum from Eastern wells oil. The results obtained from these investigations are compiled in a table. The surface layers of the various oil types at the interface between oil and water possess high elastic and visceous properties: the surface viscosity reaches values of the order of magnitude of 10^4 surface Poise. The occurrence of a maximum strength

Card 2/3

Note on the Rheologic Properties of Surface Layers at the
Oil-Water Interface and Their Role in the Stability of Oil
Emulsions

20-4-30/51

in the surface layers at the boundary of the water in the range of diluted oil solutions is apparently connected with a more intensive formation of gel by the substances of an asphaltheous and resinous type in the surface layers. The investigation of the influence of the composition of the oil phase and the water phase, of temperature, of the time of formation of the layer and of other factors on the rheologic properties of the surface layers makes it possible to select suitable methods for the dehydration and desaltification of the petroleum and the characterization of the parameters of the petroleum and an evaluation of the efficiency of the demulgators.

There are 3 figures, 1 table and 10 Slavic references

ASSOCIATION: ~~Petroleum Institute~~ . AN USSR (Institut nefti Akademii nauk SSSR)

PRESENTED: April 15, 1957, by A. V. Topchiyev, Academician

SUBMITTED: February 28, 1957

AVAILABLE: Library of Congress

Card 3/3

Кузнецов, М.М.

5(3), 21(4)

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Preky, S. L. Transactions of the Petroleum Institute, USSR. Academy of Sciences, Vol. 12 Moscow, Izdato AN USSR, 1958. 395 p. Errors slip inserted. 1,700 copies printed.

Ed.: B. I. Sargyenko, Professor; Ed. of Publishing House: K. G. Klyasov; Tech. Ed.: V. V. Golubina.

REMARKS: The book is intended for scientists, engineers, and technicians in the petroleum industry.

CONTENTS: This collection of articles describes the results of studies on the chemistry and technology of petroleum and gas conducted in the USSR, in 1966 and 1967 at the Petroleum Institute, and the Institute of Chemistry and Technology of the USSR Academy of Sciences. The collection contains 11 articles. A list of investigations published by the associates of the Institute in 1966 and 1967 and a list of dissertations for the Doctor's and Candidate's degrees presented in 1966 and 1967 at open sessions of the Academic Council of the Petroleum Institute, Academy of Sciences, USSR, are given.

Authors: P. V. Zverevskaya, I. A. Kuznetz, and V. V. Shchegoleva. The change in the Activity of Slices Oil in the Chronographic Separation of Petroleum

al. para. 6. D. M. K. Fakhry, Ya. S. Polkovnikov, and V. A. Chelintzev. Study of the Absorption Spectra of Some Cyclohexyl and Cyclopentyl Benzene Derivatives in the Near Ultraviolet Region and 2/9

Sargisyan, A. R., A. Ye. Savchenko, and A. E. Davydov. Investigation of the Composition and Properties of High-Molecular Weight Hydrocarbons and Their Derivatives of Organic Petroleum

terezynko, S. K., B. E. Derydov, A. D. Litmanovich, and Y. A. Zhukhrya, "The Physicochemical Properties of Petroleum Asphaltenes and Tar Solutions," *Part II*.

Yergiyenko, S. R., and N. T. Gordash.
Composition and Properties of the
Part 15
for Friction of Machine Oil Petrochem.

Yegorov, S. R., and Yu. I. Gordash. Low-Temperature Transformations of High-Molecular Weight Aromatic Hydrocarbons of Nakhichevskoye Petroleum. *ibid.* 16

ergylene, S. R., and Ye. V. Lebedev. Chemical Nature of Saturated High-Molecular Weight Hydrocarbons of Nonsolubino (Dronasin) Petroleum. Part 27. 102

ergylene, S. R., and Ye. V. Lebedev. Chemical Nature of Saturated High-Molecular Weight Hydrocarbons of Nonsolubino (Dronasin) Petroleum. 117

Argentine, S. R., and A. A. Michnovskaya. The Chemical Nature of
the "Benzene" and "Methane" in the Aromatic Hydrocarbons of Acetylated

Curvicauda) Petrolicum. Part 19

Virgifyenko, S. R., I. A. Pyrkina, and Ye. V. Kostina, Investigation of the Chemical Nature of High-Molecular Weight Condensed Macyclic Aromatic Compounds of Aromatic Petrolens by the Catalytic Hydrogenation

Arpigny, G. R., Jr., V. E. Ederius, and J. A. Rothman. Hydrogenation High-Molecular Weight Condensed Nitrile Arsenic Compounds of Nitrilinosulfonates in the Presence of a $W_2 - H_2S - Al_2O_3$ Catalyst under Mild Conditions. Paper 21

erglynnabes, S. N., I. A. McClellan, and Ya. V. Kosdrina. Hydrogenation of 2,3,4-trimethyl-2-pentene. *Dokl. Akad. Nauk SSSR* 227:1068, 1976. 1068

Giyachenko, A. A., V. I. Korotkiy, P. M. Galich, L. I. Pivovarov, N. K. Pylov, and M. I. Krasavtchenko. Effect of the Depth of Isotactic Cracking on the Composition and Properties of Heavy Residual Petroleum Fractions.

Gluskin, S. B., V. I. Korchagin, P. M. Galich, L. I. Pruss, B. E. Rykov, and M. I. Kharachchjo, Effect of the Nature of the Material, Oxidation Time on the Composition and Properties of Oxidized Aluminas. *Izv. Akad. Nauk SSSR, Khim. Neorg. Soedin.* 1966, No. 1, p. 1024.

Kusakov, M. M.

5(3), 11(4) PAPER I BOOK EXTRACTS 87/2221

Academy of Sciences, USSR, Institut Petri
Trudy, 4, 12 (Transactions of the Petroleum Institute, USSR, Academy of
Sciences, Vol. 12) Moscow, Izdato AN SSSR, 1953, 375 p. Extracts
included, 1,100 copies printed.

M. I. A. B. Serdyukov, Professor, M. of Pet. Eng. Inst. L. G.
Mysenev, Tech. Ed.: V. V. Oshern.

REMARKS: The book is intended for scientists, engineers, and technicians
in the petroleum industry.

CONTENTS: This collection of articles describes the results of studies on
the chemistry and technology of petroleum and gas conducted in the
Laboratory of the Petroleum Institute, Academy of Sciences, USSR, in
1956 and 1957. A new section "Petroleum Chemistry and Technology
of Petroleum" has been included in this collection of articles. A list
of investigations published in the journals of the Institute in 1956
and 1957 and a list of dissertations for the Doctor's and Candidate's
degrees defended in 1956 and 1957 at open sessions of the Academy
of Sciences of the USSR are given.

REMARKS: The book is intended for scientists, engineers, and technicians
in the petroleum industry.

V. ARTICLES ON VARIOUS PROBLEMS

Dubrov, M. M., Z. A. Kozlovskaya, and V. I. Andreeva. Effect of Pressure
on Viscosity and Structure Formation of Lubricating Oils 339

Lavrov, P. A., and M. A. Duboslav. The Role of Nitrocellulose in Self-
Ignition of a Mixture of Methylpentadiene and Nitric Acid. Report I 35A

Burakov, P. A., V. M. Andrianov. Some Problems in the Economics of
Petroleum Refining 363

Dubrov, M. M. (Deceased) 372

Dissertations presented at sessions of the Academic Council of the
Petroleum Institute, Academy of Sciences, USSR, in 1956 and 1957 373

Investigations on the chemistry and technology of petroleum and gas
carried out at the Petroleum Institute, Academy of Sciences, USSR,
and published in 1956-1957 375

Papers not included in the bibliography of Vol. I of Study Institute
Part II 381

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KUSAKOV, M. M.

672

[illegible]

100

1. The first step in the process of creating a new product is to identify a market need. This involves conducting market research to understand what consumers want and what problems they are facing.

Sponsorship Agencies: USSR, diamoye upravleniye po ispol'zovaniyu atomoy energii, and Akademiya nauk SSSR.

Editorial Board of Set: V.I. Dikushin, Academician (Resp. Ed.), M.M. Shumilovskiy (Deputy Resp. Ed.), Yu. S. Zaslavskiy (Deputy Resp. Ed.), L.K. Tatchenko, B.I. Verkhovskiy, S.F. Nazarov, L.I. Petrovskiy and M.G. Zaslavinskaya (Secretary).

Ed. of Publishing House: P.M. Belyanin; Tech. Ed.: T.P. Polosova.

PURPOSE: This book is intended for specialists in the field of machine and instrument manufacture who use radioactive isotopes in the study of materials and processes.

COVERAGE: This collection of papers covers a very wide field of the utilization of tracer methods in industrial research and control techniques. The topic of this volume is the use of radiotopes in the machine- and instrument-manufacturing industry. The individual papers discuss the applications of radiotope techniques in the study of castings and alloys, problems of friction and lubrication, metal cutting, engine performance, radiotopes in the automation of industrial processes, recording and measuring devices, quality control, flowmeters, level gauges, safety devices, radioactive control, etc. These papers represent contributions of various Soviet institutes and laboratories. They were published as Transactions of the All-Union Conference on the Use of Radioactive and Stable Isotopes in Machine Building, held in Moscow by the Academy of Sciences of the USSR, on November 2, 1957. The conference was mentioned in the *Engineering News-Record* of November 11, 1957. The references are given at the end of most of the papers.

Leikina, M.D. (Centralny nauchno-issledovatel'skiy dizel'nyy institut - Diesel Research Institute). Effect of the Number of Re-
volutions and Maximum Cycle Pressure on the Wear of Upper Plates 43
and Cylinder Sleeve in Diesels

Shenavich, A.I. (Naukno-Issledovatel'skiy traktornyy institut - Tractor Research Institute). Study of the Effect of Dust on the Wear of Parts of Tractor Engines

Salomskiy, Yu. S., O. I. Shor, and I. A. Morozova (VNI PO topolizatsii nefti i gaz). *Podobnyye nefti i gaz*. Izdatel'stvo nauchnoy literatury, Moscow, 1964.

64 Zaslavskiy, Yu.S., S.M. Kravtsov, A.M. Shneyerson, and G.I. Shor
Vil'ni po pereborny netfi i sara i polubnary izmestovozhgo
All-Union Scientific Research Institute for
khimicheskogo topkiva - All-Union Scientific Research Institute for
the Processing of Petroleum and Gas and the Production of Synthetic
Liquid Fuel). Study of the Mechanism of the Action of Anticorro-
sive Oil Additives

Chernov, M.S., O.V. Vinogradov, E.A. Baranovskaya, E.I. Senia, and A.Y. Litvinova (Institut nefti AN SSSR - Petroleum Institute, Academy of Sciences, USSR). Study of the Mechanism of the Inter-
action of Oil Additives with Metal. 67

studnits. Ye.Ye. (Vsesoyuznyy nauchno-issledovatel'skiy agol'nyy institut - All-Union Mining Research Institute). Study of the wear of gears in Mining Machinery

SERGIYENKO, S.R., prof., otvetstvennyy red.; TOPCHIEV, A.V., akademik, red.; KAZANSKIY, B.A., akademik, red.; FEDOROV, V.S., kand.tekhn.nauk, red.; KUSAKOV, M.M., prof., red.; PLATE, A.F., prof., red.; NIKOLAYEVA, V.G., kand.tekhn.nauk, red.; NEKRASOV, A.S., red. izd-va; PAVLOVSKIY, A.A., tekhn.red.

[Composition and properties of the high-molecular part of petroleum; a collection of papers on the composition and properties of petroleum and petroleum products] Sostav i svoistva vysokomolekuliarnoi chasti nefli; sbornik rabot po izucheniiu sostava i svoistv neftei i nefteproduktov. Moskva, Izd-vo Akad. nauk SSSR, 1958. 369 p. (MIRA 11:4)

1. Akademiya nauk SSSR. Institut nefli.
(Petroleum--Analysis)

KUSAKOV, M. M.

with A. Yu. Koshevnik and N. M. Lubman "Study of the Effect of Pressure on the Selective Saturation of Quartz Rocks With Water or Crude Oil" *ibid.*

with N. M. Lubman and A. A. Kocheshkov "Influence of Pressure on the Speed Rate of Capillary Saturation of Porous Formations" *ibid.*

Transactions of the Petroleum Institute, Acad. Sci. USSR, v. 11, Oil Field Industry, Moscow, Izd-vo AN SSSR, 1958. 346pp.

LEBEDEV, V.V.; KUSAKOV, M.M.

Capillary hysteresis following the rise of a viscous liquid in
ascending conical capillaries. Izv. vys. uchab.zav.; fiz. no.1:
15-28 '58. (MIRA 11:6)

1.Moskovskiy neftyanoy institut imeni akad. I.M. Gubkina.
(Capillarity)

MEKENITSKAYA, L.I.; KUSAKOV, M.M.

Molecular characteristics of oil-sand surfaces. Izv.vys.ucheb.zav.;
neft' i gaz 1 no.9:53-60 ' 58. (MIRA 11:12)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti
imeni akademika I.M. Gubkina.
(Oil sands)

KUSAKOV, M. M.

65-58-4-10/12

AUTHORS: Kusakov, M. M., Landau, M. A., Lubman, M. M., and
Shekhtsko, M. I.

TITLE: Calcium Hydride Method for Determining the Content of
the Water in Fuel When Taking into Account the Kinetics
of Evolution of Hydrogen (Gidridkal'nyiye metody
opredeleniya soderzhaniya vody v toplive s uchetom
kinetiki vydeleniya vodoroda)

PERIODICAL: Khimiya i Tekhnologiya Topliv i Masel, 1959, No 4,
pp 55 - 61 (USSR)

ABSTRACT: The solubility of water in hydrocarbon liquids, and, partly in
fuels and oils depends in a varying degree on their
chemical composition and on the temperature (Refs. 1
and 2); the liquids are very hygroscopic. The calcium
hydride method is one of the most important amongst
the physical and chemical methods of determining the
water content in hydrocarbon liquids (Refs. 3-8).
It is based on measuring the volume (V method) or the
pressure (P method) of hydrogen, separated during the
reaction of calcium hydride and water. Formulae are
derived for calculating the water content according to
both methods (formulae 2 and 7). When excess calcium
hydride is reacted with water a second order reaction
takes place. A graphical method for the determination
of the volume or pressure of hydrogen is also given.

Card 1/2

65-58-4-10/12

Calcium Hydride Method for Determining the Content of the Water in Fuel When Taking into Account the Kinetics of Evolution of Hydrogen

A second variation of the P method makes it possible to determine the content of water in hydrogen liquids with an accuracy of about 3%. This method is recommended for Research Institutes for determining the waters dispersed in the form of very fine drops. When calculating the evolution of hydrogen according to the V method it is possible to shorten the time of the experiment, and to increase the accuracy of measurements to about 3% - 5%. Formulae for calculating the reaction kinetics of the interaction of calcium hydride in water are given (formulae 8 - 10). Experiments were carried out with synthetic mixtures of the fuel T-1 and petrol B-70 with water in reaction pumps (Fig. 1). Table 1 and 2 shows results of experiments according to the V method and P method respectively. There are 6 Figures, 2 Tables, and 10 References: 6 Russian, 2 English and 2 German.

ASSOCIATION: Petroleum Institute AS USSR (Institut nefti AN SSSR)

Card 2/2

1. Water-Determination
2. Calcium hydride-Applications
3. Fuels-Impurities

AUTHORS: Kusakov, M. M., Mekenitskaya, L. I. SOV/156-58-4-11/49

TITLE: Method of Determining the Ratio Between Hydrophobic and Hydrophilic Surface on Uncemented Porous Mass (Metod opredeleniya sootnosheniya gidrofobnoy i gidrofil'noy poverkhnostey nestsementirovannykh poristoykh sred)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 4, pp 656-659 (USSR)

ABSTRACT: A method of characterizing the ratio between the hydrophilic and hydrophobic surface of the porous mass was suggested for determining oil-containing sand. The ratio between hydrophobic surface $S_{\text{hydrophobic}}$ and $S_{\text{hydrophilic}}$ is determined by the magnitude γ , which is the characteristic feature of the molecular surface of oil-containing sand:

$$\gamma = \frac{S_{\text{hydrophobic}}}{S_{\text{hydrophilic}}} = \frac{S_{\text{hydrophobic}}}{S - S_{\text{hydrophobic}}}$$

Card 1/2 $S = S_{\text{hydrophobic}} + S_{\text{hydrophilic}}$ is the total surface of the solid phase. The ratio γ of oil-containing sand was determined

SOV/156-58-4-11/49

Method of Determining the Ratio Between Hydrophobic and Hydrophilic Surface
on Uncemented Porous Mass

by the adsorption method. The method of determining the magnitude γ is described in detail. Mersolate was used as an adsorbing agent. Experiments with synthetic sand mixtures containing different hydrophobic and hydrophilic quantities were carried out to check this method experimentally. A calibration curve was plotted. The determination of the ratio $S_{\text{hydrophobic}} : S_{\text{hydrophilic}}$ was compared to the determinations of synthetically produced sand. Satisfactory results were obtained. There are 3 figures and 7 references, 5 of which are Soviet.

ASSOCIATION: Kafedra fiziki Moskovskogo neftyanogo instituta im. akad.
I. M. Gubkina (Chair of Physics at the Moscow Institute of
Petroleum imeni Academician I. M. Gubkin)

SUBMITTED: March 26, 1958

Card 2/2

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SOV/58-59-7-16560

Translation from: Referativnyy Zhurnal Fizika, 1959, Nr 7, p 271 (USSR)

AUTHORS: Gal'perin, G.D., Kusakov, M.M., Pokrovskaya, Ye.S., Shimanko, N.A.

TITLE: Study of the Absorption Spectra of Some Cyclohexyl and Cyclopentyl Derivatives of Benzene in the Near Ultraviolet Region

PERIODICAL: Tr. In-ta nefti. AS USSR, 1958, Vol 12, pp 38 - 64

ABSTRACT: The authors studied the absorption spectra of a number of cyclohexyl and cyclopentyl derivatives of benzene and its methylated homologs in a solution of isooctane in the 2,200 to 2,900 Å region. They demonstrated the possibility of determining the position of alicyclic substitutes in the benzene ring. In some cases it is possible to identify isomers of identical structure with cyclohexyl, cyclopentyl, methyl, or both methyl and cyclic substitutes. The advantages of the described method of studying structure, as compared with the chemical method, are its simplicity, the possibility of carrying out measurements in the liquid phase and at room temperature, and the small size of the sample required for analysis (hundredths of a gram).

L. Dmitrenko

Card 1/1

KUSAKOV, M.M.; KONVALOVA, L.A.; AVDEYEVA, V.I.

Effect of the pressure on the viscosity and structure of lubricating
oils. Trudy Inst.nefti, 12:339-353 '58. (MIRA 12:3)
(Lubrication and lubricants)

KOSHELEVA, I.M.; KUSAKOV, M.M.

Displacement of mutually soluble liquid hydrocarbons in porous
media. Trudy MNI no.22:158-169 '58. (MIRA 12:4)
(Oil reservoir engineering)

KUSAKOV, M.M.; KOSHELEVA, I.M.

Effect of capillary forces on water flooding of liquid hydro-
carbons from hydrophilic porous media. Trudy MNI no.22:170-180
'58. (MIRA 12:4)

(Oil field flooding)

KUSAKOV, M.M.; KOSHELEVA, I.M.

Flooding oil from hydrophobic porous media with water. Trudy MNI
no.22:181-197 '58. (MIRA 12:4)
(Oil field flooding)

KUSAKOV, M.M.; GIMATUDINOV, Sh.K.

Capillary displacement of oil with water in natural cores.

Trudy MNI no.22:198-206 '58.

(MIRA 12:4)

(Oil field flooding)

GIMATUDINOV, Sh.K.; KUSAKOV, M.M.

Effect of rate of water flooding of oil from natural cores on oil
recovery. Trudy MNI no.22:207-216 '58. (MIRA 12:4)
(Oil field flooding)

KOCHERSKOV, A.A.; KUSAKOV, M.M.; LUBMAN, N.H.

Mechanism of the capillary percolation and propulsion in
porous media. Izv.vys.ucheb.zav.; neft' i gaz 1 no.11:
59-64 '58. (MIRA 12:5)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti im. akad.I.M.Gubkina.
(Capillarity)

KOCHESHKOV, A.A.; KUSAKOV, M.M.; LUBMAN, N.M.

Effect of pressure on the speed of capillary percolation of
polar liquids in porous media. Izv.vys.ucheb.zav.; neft' i
gaz 1 no.12:69-76 '58. (MIRA 12:4)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlen-
nosti im. akad.I.M.Gubkina.
(Capillarity)

507/74-27-10-1/4

AUTHORS: Topchiyev, A. V., Kazanskiy, B. A., Musayev, I. A., Gal'pern, G. D., Kusakov, M. M., Plate, A. F. (Moscow)

TITLE: Investigation of the Composition of the Light Fractions of Soviet Crudes (Issledovaniye sostava legkikh fraktsiy sovetskikh neftey)

PERIODICAL: Uspekhi khimii, 1958, Vol 27, Nr 10, pp 1177-1197 (USSR)

ABSTRACT: This paper gives a chronological report on the fundamental publications on the investigation of the composition of the light fractions of the Soviet mineral oils which have hitherto been made. In this connection special attention is paid to those publications which are edited by N. D. Zelinskiy, his collaborators and students (Refs 1-50). As may be seen from the present paper the current investigations of the mineral oil fractions until the years 1937, 1939 were carried out mainly in connection with a chemical characterization of the light benzoin and benzene ligroin fractions of mineral oil. Only in the 1940's methods were elaborated for the intensification of the individual investigation of the light fractions of the Soviet mineral oils. At the beginning of this paper reports are made on the first

Card 1/3

SOV/74-27-10-1/4

Investigation of the Composition of the Light Fractions of Soviet
Crudes

work carried out in 1881-83 (Bel'shteyn and Kurbatov). The diverse research institutes of mineralogy which have been established are chronologically mentioned (e. g.: 1924: the first central (Gosudarstvennyy Issledovatel'skiy neftyanoy Institut) State Research Institute of **Petroleum** in Moscow); 1934: Institut goryuchikh iskopayemykh AN SSSR (Institute of Combustible Minerals AS USSR), diverse chemo-technical laboratories of the GINI (State Research Institute of **Petroleum**) as well as diverse research institutes in the Republics of the Union: Azerbaydzhanskaya SSR, **Uzbekskaya** SSR, **Turkmen'skaya** SSR, and others. After World War II methods of group analysis on a higher level were elaborated for the investigation of the petroleum naphtha fractions (with a further differentiation of the hydrocarbon subgroups). It was necessary to investigate in detail the composition of the hydrocarbons of the light mineral oil fractions because of the rapid development of air plane and automobile motor construction in the USSR. Due to this fact the demands concerning the quality of the motor fuel as well as of the crude oil changed. Especially in 1955 intensive investigations of the individual composition of the hydrocarbons of gasoline produced by cracking were carried out by using the chromatographic distribution of

Card 2/3

SOV/74-27-10-1/4

Investigation of the Composition of the Light Fractions of
Soviet Crudes

adsorption, the catalytic analytic hydrogenation and dehydrogenation as well as spectrum analysis by means of combined dispersion of light (Refs 108-160). In conclusion the authors are of the opinion that mere geological and geochemical factors are not sufficient for the production of experimentally founded theories on the formation and the change of **petroleum** under the conditions of migration. A great number of important data are necessary for the solution of the problem of the formation of **petroleum**, namely the nature, the concentration and the composition of the hydrocarbon components (or the non-hydrocarbon components); i. e., of the organosulfuric, nitrogen and oxygen compounds which belong to the composition of **petroleum**. There are 160 references, 160 of which are Soviet.

Card 3/3

KUSAKOV, M.M.; GUDOK, N.S.

Effect of external pressure on filtration properties of oil-bearing rocks. Neft. khoz. 36 no.6:40-47 Je '58. (MIRA 11:9)
(Rocks--Permeability)

20-119-1-29/52

AUTHORS: Kusakov, M. M., Nekrasov, D. N.

TITLE: The Rise of a Liquid in Capillaries of Variable Cross Section and Capillary Hysteresis (Pod"yem zhidkostiv kapillyarakh peremennogo secheniya i kapillyarnyy gisterezis)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 119, Nr 1, pp. 107-109 (USSR)

ABSTRACT: For capillary tubes with circular cross section the height h of the capillary rise of a nonviscous liquid can be determined from the condition $\partial U / \partial h = 0$. Here

$$U = \pi g \int_0^h r^2 dh - 2\pi \sigma \int_0^h r dh \quad \text{denotes the potential energy}$$

of the wetting liquid in the tube: ρ denotes the density of the liquid, g - gravitation, r - the radius of the capillaries and σ - the surface tension of the liquid at its boundary against the supersaturated vapor. The expression for U given here holds on the premise that the meniscus is spherical and that the liquid wets the walls of the capillaries. In the same expression the function $r = f(h)$ determines the (rotation-symmetrical with regard to the axis of the capil-

Card 1/3

20-119-1-29/52

The Rise of a Liquid in Capillaries of Variable Cross Section and Capillary Hysteresis

larities) form of the capillaries. The heights of the capillary rise in a capillary with variable cross section can also be determined by a simultaneous solution of the equation system $h\varrho g = 2\sigma/r$ and $r = f(h)$. For a capillary, the form of which is determined by the equation $r = 2\sigma/h\varrho g$, there is an equilibrium for every height of the liquid. In this case the interior surface of the capillary is formed by rotation of a hyperbola around the vertical axis of the capillary. Thus the nonreproducibility observed in some liquids is connected with the heights of the capillary rise. In many cases the capillaries in fact have a variable cross section. The considerations here discussed were checked by means of the capillary rise of water in conic capillaries becoming narrower and also in glass capillaries with sinusoidal periodically variable cross section, which were produced for this purpose. For a sinusoidal capillary here the curves $U = f(h)$, $h\varrho g = f(h)$ and $2\sigma/r = f(h)$ are given. Finally numerical data for a concrete example are given. The final conclusion of the existence of several heights of the capillary rise in capillaries with variable cross section (this phenomenon is known under the name of capillary hysteresis) can be ob-

Card 2/3

20-119-1-29/52

The Rise of a Liquid in Capillaries of Variable Cross Section and Ca-
pillary Hysteresis

tained by investigation of the general conditions for the
equilibrium of the liquid in the capillaries. There are
1 figure and 2 references, 1 of which is Soviet.

PRESENTED: August 8, 1957, by A. V. Topchiyev, Member, Academy of Sciences,
USSR

SUBMITTED: July 29, 1957

Card 3/3

AUTHORS: Gudok, N. S., Kusakov, M. M. 20-119-2-9/60

TITLE: Experimental Investigation of the Influence
Exerted by the External Pressure on the Permeability
of Oil-Bearing Rocks (Eksperimental'noye issledovaniye
vliyaniya vneshnego davleniya na pronitsayemost'
neftesoderzhashchikh porod)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol 119, Nr 2,
pp 229-232 (USSR)

ABSTRACT: In connection with the problem of unsteady filtration and
the reconstitution of the pressure in oil-bearing layers,
the experimental investigation of the character of
deformation of the oil-bearing layers on the influence
of the external pressure P_{ext} of the rocks placed on
them is of interest. The investigation of the influence
of the external pressure on the velocity of filtration
of the liquid in oil-bearing rocks (according to the
volume) makes it possible to judge the character of the
change of the permeability of these rocks in their

Card 1/4

Experimental Investigation of the Influence
Exerted by the External Pressure on the Permeability of
Oil-Bearing Rocks

20-119-2-9/60

loading and unloading. The filtration was investigated in the samples of natural oil-bearing rocks (from the Bashkiric and Caucasian oil deposits). The external pressure was exerted by hydraulic compression of the lateral surface of the sample through a thin lead casing, and it amounted up to 600 atmospheres excess pressure. The permeability K was measured by means of the UIPK-1-apparatus and the drop of pressure in the rock sample was determined for a given filtration velocity. Nonpolar kerosene served as filtering liquid. The authors determined the curves $K = f(P_{ext.})$ in the case of increased and decreased external pressure with constant rock pressure. The measurements at the rock samples of different permeability showed the following: In all cases without exception the linear rule of filtration is valid on the basis of which the permeability K at different $P_{ext.}$ was calculated. From the results obtained 2 main types of curves result $K = f(P_{ext.})$. To the first type belong

Card 2/4

Experimental Investigation of the Influence
Exerted by the External Pressure on the Permeability of
Oil-Bearing Rocks

20-119-2-9/60

the curves which characterize the locking of remanent deformations in the samples in the case of decreasing or increasing the external pressure. The curves of the second type, however, characterize the presence of a remanent deformation in the case of a change of pressure. The character of the change of permeability in a repeated cycle depends on the fact if the sample at the end of the inverse course of the first cycle was completely unloaded or if the repeated cycle began at such a pressure at which the external cycle was finished. The character of the deformation of different rocks (sandstones, limestones, aleurolithes, dolomites etc.) is different and depends on their mineral composition, on the structure and on the composition of the cementing substance. According to the results obtained here remanent deformations exist in oil-bearing rocks which can be explained by the occurrence of plastic properties in the presence of external pressures.

Card 3/4

Experimental Investigation of the Influence 20-119-2-9/60
Exerted by the External Pressure on the Permeability of
Oil-Bearing Rocks

In most cases these plastic properties of the rocks are connected with their structure and with the plasticity of the cementing substance. There are 1 figure and 7 references, 2 of which are Soviet.

PRESENTED: September 23, 1957, by S. A. Khristianovich, Member,
Academy of Sciences USSR

SUBMITTED: September 20, 1957

AVAILABLE: Library of Congress

Card 4/4

KUSAKOV, M.M.

PHASE I BOOK EXPLOITATION

SOV/4606

Akademiya nauk SSSR. Institut nefti

Khimiya nefti (Petroleum Chemistry) Moscow, 1959. 311 p. (Its: Trudy, tom 13) Errata slip inserted. 2,000 copies printed.

Resp. Ed.: G.D. Gal'pern, Doctor of Chemical Sciences; Ed. of Publishing House: L.S. Povarov; Tech. Ed.: V.V. Volkova.

PURPOSE: This book is intended for organic and industrial chemists and specialists in petroleum technology.

COVERAGE: This issue of the Transactions of the Petroleum Institute of the Academy of Sciences USSR contains twenty-five articles which review original laboratory experiments conducted by personnel of the Otdel khimii i tekhnologii nefti (Department of Chemistry and Petroleum Technology). Individual papers deal with studies of the composition and properties of petroleum and petroleum products, methods of their separation and synthesis, and physicochemical characteristics of standard petroleum compounds. The use of gaseous solutions to distinguish heavy raw-petroleum fractions from ozocerites, thermal processes of contact and catalytic refining and synthesizing, and theoretical problems

~~Card 1/6~~

SOV/4606

Petroleum Chemistry

in the pre-refining treatment of petroleum are also discussed. References accompany each article.

TABLE OF CONTENTS:

From the Editor

3

Pokrovskaya, Ye.S. Alkylation of Alkyl Benzenes With Some Olefins and Cyclopentenenes

5

Gal'pern, G.D., M.M. Kusakov, and N.A. Shimanko. Investigation of the Absorption Spectra of Some Benzene Derivatives in the Near Ultraviolet Range

11

Pokrovskaya, Ye.S. Synthesis of Ethylindanes by the Alkylation of Indane With Ethyl Bromide

29

Musatov, K.A. Chromatographic Separation of Aromatic and Sulfurous Concentrates From Kerosene

33

~~Card 2/6~~

Petroleum Chemistry

SOV/4606

- Gal'pern, G.D., Ye.N. Karaulova, and T.S. Novozhilova. Study of the Adsorption of Sulfoxides From Dilute Solutions 51
- Sanin, P.I., and N.V. Melent'yeva. Influence of the Structure of Hydrocarbons on Their Viscosity 58
- Sergiyenko, S.R., Yu.T. Gordash, M.M. Kusakov, and M.V. Shishkina. Structure of Naphthalene Homologs in the High-Molecular Fraction of Petroleum 80
- Sergiyenko, S.R., M.I. Krasavchenko, and M.P. Teterina. Conversion of High-Molecular Aromatic Compounds From Romashkino Petroleum at 300-350°C 97
- Bezinger, N.N., G.D. Gal'pern, and T.I. Savost'yanova. Determination of the Total Amount of Nitrogen in Petroleums by the Modified Micro Method of Dumas 111
- Sergiyenko, S.R., P.Ya. Demenkova, I.O. Delone, and A.P. Kurbatskaya. Distribution of "Microelements" [Trace Elements] in Petroleum Tars and Asphaltenes 118

Card 3/6

Petroleum Chemistry

SOV/4606

Zhuze, T.P., and B.K. Sheremeta. An Adsorption Method of Refining Raw Ozocerites Using Compressed Gases for Extraction

280

Petrov, A.A., and M.M. Kusakov. Study of Rheological Properties of Surface Layers at a Petroleum—Water Interface

287

AVAILABLE: Library of Congress

Card-6/6

JA/dwm/sfm
1-17-61

KUSAKOV, M.M.; TAIROV, N.D.

Wetting quartz with hydrocarbon liquids and water under high pressures and temperatures. Dokl.AN Azerb.SSR no.11:1019-1023 '59. (MIRA 13:4)

1. Azerbaydzhanskiy nauchno-issledovatel'skiy institut po dobyche nefti. Predstavleno akademikom AN Azerbaydzhanskoy SSR M.F. Nagiyevym.

(Wetting) (Quartz)

BOGOMOLOVA, A.F.; KOCHESHKOV, A.A.; KRYLOV, A.P.; KUSAKOV, M.M.

Experimental study of oil recovery in waterflood operations in
the presence of free gas. Trudy VNII no.25:73-79 '59.
(MIRA 15:4)

1. IORGI AN SSSR.

(Oil reservoir engineering)

24 (7), 5 (4)
AUTHORS:

Kusakov, M. M., Shishkova, M. V.

SCV/48-23-10-31/39

TITLE:

The Absorption Spectra of the Hydrocarbons of the Indan Series in the Near Ultraviolet Range

PERIODICAL:

Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 10, pp 1251 - 1252 (USSR)

ABSTRACT:

By means of infrared and Raman analysis indan and its methylated homologues were found in a number of petroleum fractions. In order to obtain exact characteristics of the indan homologues, the hydrocarbons of indan were synthesized with one, two, and three substituents of various structures at the Laboratoriya khimii nefli Instituta neftekhimicheskogo sinteza AN SSSR (Laboratory for Petroleum Chemistry of the Institute for the Petroleum-chemical Synthesis of the AS USSR). By means of a photoelectric spectrophotometer the absorption spectra of the solutions of indan and 14 of its derivatives in isooctane were investigated. The absorption spectra of ethyl-, isopropyl-, isobutyl-, tertiary butyl-, isoamyl-, and 2-ethyl-hexyl indan all had bands with maxima at 2765, 2710, 2680, and 2630 Å. This showed that the spectra were practically independent of the structure of the substituent if the latter was saturated.

Card 1/2

The Absorption Spectra of the Hydrocarbons of the Indan Series in the Near Ultraviolet Range

SOV/48-23-10-31/39

The absorption spectrum of cyclopentyl-indan was found to be shifted in the direction of longer wave lengths by 10 - 15 Å as compared to that of 5-alkyl indans, which is a consequence of the naphthene character of the substituent. The spectra of the 2-hexyl indan and isobutyl indan are practically equal to that of 1-methyl indan (maxima at 2735, 2665, 2605, and 2545 Å). In the following the spectra of the di-substituted indans with ethyl-, isopropyl- and isobutyl groups in the benzene ring, as well as those of the trisubstituted indans are briefly discussed. In conclusion it is said that the distribution of the intensities in the absorption bands does not depend on the structure of the substituting groups. There are 9 references, 6 of which are Soviet.

ASSOCIATION: Institut neftekhimicheskogo sinteza Akademii nauk SSSR (Institute for Petroleum-chemical Synthesis of the Academy of Sciences, USSR)

Card 2/2

KUSAKOV, M.M.; MEKENITSKAYA, L.I.

Study of the state of bound water on models of oil and gas
reservoirs. Trudy MINKHIGP no.25:302-313 '59. (MIRA 15:5)
(oil field brines)

5(3)

SOV/80-32-5-36/52

AUTHORS: Vinogradov, G.V., Kusakov, M.M., Sanin, P.I., Razumovskaya, E.A., Ul'-yanova, A.V.

TITLE: The Interaction of Thioorganic and Thiophosphoroorganic Additions to Oils With Metals

PERIODICAL: Zhurnal prikladnoy khimii, 1959, Vol 32, Nr 5, pp 1136-1141 (USSR)

ABSTRACT: Anti-wear admixtures to oils containing sulfur-, phosphorus- and chlorine-compounds are widely applied. The functional limits of their action is investigated here by means of labeled atoms. They were dissolved in the non-polar fraction of bright stock and their interaction with chromium-manganese-silicon steel and electrolytic copper was studied. The interaction of steel with sulfur starts already at room temperature. The reaction of sulfur with copper is more intense. The reactivity of disulfide is higher than that of sulfide due to the higher mobility of the sulfur atoms in the disulfide molecule. The sulfur is bound to steel and copper irreversibly, i.e. chemically. Experiments with tributyltrithiophosphite labeled by P^{32} and S^{35} have shown that phosphorus reacts more intensively with steel than sulfur. At 20°C it is bound in the amount of 4.2 mg/cm^2 . At 140°C and higher the decomposition of tributyltri-

Card 1/2

SOV/80-32-5-36/52

The Interaction of Thiocorganic and Thiophosphoroorganic Additions to Oils With Metals

thiophosphonite starts which may be regarded as the upper limit of the protective action. A film of iron phosphide is more easily formed on steel than a sulfide film. At a temperature increase sulfur reacts more intensively with copper than with steel. There are 5 graphs, 1 table and 6 references, 5 of which are Soviet and 1 American.

SUBMITTED: January 22, 1958

Card 2/2

5(4)

AUTHORS:

Koshevnik, A. Yu., Kuzakov, M. M.,
Lubman, R. M.

SOV/76-33-1-33/45

TITLE:

The Influence of Surface Active Substances on the Motion of Gas Bubbles in Hydrocarbon Liquids (Vliyaniye poverkhnostno-aktivnykh veshchestv na dvizheniye gazovykh puzyr'kov v uglevodorodnykh zhidkostyakh)

J. JOURNAL:

Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 1, pp 197-203 (USSR)

ABSTRACT:

The gas diffusion in a liquid determines the solubility of the gas at stationary as well as agitated phase boundaries. The influence of surface active substances on the solution process of gases, e.g. on pressure extraction of petroleum, or the petroleum transportation in pipes, is of special importance. The influence of an adsorption layer in the separating phase layer had been commented upon earlier in publications (Ref 1). In the case under discussion tests were carried out in pure apolar petroleum and in real and colloidal solutions of various surfaces of active substances; and the influence of these substances on the solution kinetics of the air bubbles in petroleum was investigated. A glass implement was used for

Card 1/3

The Influence of Surface Active Substances
on the Motion of Gas Bubbles in Hydrocarbon Liquids

SOV/76-33-1-33/45

observing the air bubbles (Fig 1) and the size of the air bubbles was measured to an accuracy of 10μ by means of a microscope. The implement was in a thermostat at $20 \pm 0.02^\circ\text{C}$. The rising velocity and the change of the air bubble size in connection with it was determined as a function of the air diffusion into the petroleum. Two samples of a kinematic viscosity of 85 and 137 ccm were used as apolar petroleum and air bubbles of a diameter from $100-900\mu$ were measured. It is stated (Fig 3) that, in this case, the equation by Stokes (Stokes)(2) is valid without a correction according to Hadamard-Rybczinski (Adamar-Rybczinski)(Refs 4, 5), i.e. small gas bubbles of this dimension react like solid spheres. Tests in variously concentrated heptylic acid solutions (in petroleum $\nu = 85$ ccm) and with palmitic acid, hexyl and cetyl alcohol and β -naphtylamine showed that the diffusion air/petroleum becomes more difficult with the concentration rise of these substances whereas the rising velocity of the air bubbles is not influenced.

Card 2/3

The Influence of Surface Active Substances
on the Motion of Gas Bubbles in Hydrocarbon Liquids

SOV/76-33-1-33/45

The colloidal solution of a polymethyl-siloxane liquid in petroleum showed, beside the diffusion stopping, also a decrease of the rising velocity of the air bubbles. The equation by Boussinesq (Bussine)(Ref 7) could not be investigated for lack of experimental data. There are 5 figures and 7 references, 1 of which is Soviet.

ASSOCIATION: Akademiya nauk SSSR, Institut nefiti (Academy of Sciences,
USSR, Institute of Petroleum)

SUBMITTED: July 10, 1957

Card 3/3

KUSAKOV, M.M.; LUBMAN, N.M.; KOSHEVNIK, A.Yu.; KOSHELEVA, I.M.;
MEKENITSKAYA, L.I.

Studies of the physical chemistry of oil layers. Trudy Inst. geol.
1 razrab. gor. iskop. 2:71-80 '60. (MIRA 14:5)
(Oil reservoir engineering)

BOGOMOLOVA, A.F.; KUSAKOV, M.M.

Studying capillary petroleum in a model porous medium. Trudy Inst.
geol. i razrab. gor. iskop. 2:81-94 '60. (MIRA 14:5)
(Petroleum) (Capillarity)

S/081/61/000/014/026/030
B105/B202

AUTHORS: Kusakov M. M., Konovalova L. A., Prokof'yeva Ye. A.,
Sidorenko V. I.

TITLE: Effect of temperature and pressure on the viscosity of
mixtures of mineral oils and organosilicon liquids

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 14, 1961, 543,
abstract 14M249 (Tr. 3-y Vses. konferentsii po treniyu
i iznosu v mashinakh. M., AN SSSR, v. 3, 1960, 262 - 270)

TEXT: The authors present experimental data on the viscosity of the
solutions of polysiloxane liquids (PL) in mineral oils at atmospheric
pressure and in the temperature interval of -50 to $+60^{\circ}\text{C}$ as well as at
pressures of up to 3000 kg/cm^2 in the temperature interval of from $+10$ to
 $+50^{\circ}\text{C}$. The viscosity measurements (dynamic) at atmospheric pressure and
at different temperatures were made by means of the capillary viscosimeter
of the type Ubbelohde and at high pressures by means of the falling-sphere
viscosimeter. The components of the mixture were mineral oils MVP and the
spindle oil AU as well as ethyl- and butyl polysiloxane liquids. The
Card 1/3

S/081/61/000/014/026/030
B105/B202

Effect of temperature and pressure ...


authors give temperature curves of the viscosity of the oils MVP, AU and of three PL. An addition of PL to the oils MVP and AU improves the temperature curve of their viscosity by increasing its slope in the field of low temperatures. With simultaneous addition of PL and high-molecular thickeners to the oil, the effect of PL mainly causes an increase of the temperature slope of the viscosity temperature curve; the effect of the thickener leads to an increase of the viscosity level. The effect of PL and the thickener becomes manifest independently. For all temperatures investigated the effect of PL is the stronger the higher the pressure. The results of the study of the piezometric dependence of the viscosity of the mixture of mineral oil and PL showed that the viscosity of the mixtures at given pressure is no additive property. The deviation of the viscosity isobars from the linearity increases with increasing pressure and with increasing difference in the piezometric coefficients of viscosity of the oil and PL. With increasing pressure and at a certain ratio of the components, the viscosity isobars of the mixtures show a certain minimum. With addition of various commercial PL to the oils, the

Card 2/3

S/081/61/000/014/026/030
B105/B202

Effect of temperature and pressure ...

character of the change of the relative viscosity depends on pressure and temperature. In this case relative viscosity decreases with increasing PL content in the mixture. With increasing concentration of PL in the mineral oil the piezocoefficient of viscosity decreases. [Abstracter's note: Complete translation.]



Card 3/3

80292

~~XXXX~~

S/170/60/003/04/25/027

B007/B102

24.4100

AUTHOR: Kusakov, M. M.

TITLE: The Application of Two-dimensional Methods in Rheology

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1960, Vol. 3, No. 4, pp. 132-141

TEXT: This paper brings a survey on the two-dimensional methods and the respective device which can be used in viscometry of lubricants. Such are the method of blowing-off of a thin oil layer (Refs. 3-12), the method based on the fall of a small ball (Refs. 15-17) and the method of the continuously varying deformation rate of plastic bodies (Refs. 18-20). Besides, the "hook" method by D. S. Rozhdestvenskiy (Ref. 1) is mentioned. The first method was suggested for the first time by B. V. Deryagin (Ref. 3). The viscous liquid flows in a thin stratum. The flow is kept up by the tangential force on the surface, which is established by an air jet. This air jet is blown through a narrow slit in the wall upon which the thin liquid stratum is applied. After such a "blowing-off" of the oil stratum the latter becomes so thin that in reflected monochromatic light the interference image of the lines of equal thickness can be observed. Viscosity and other mechanical properties of the oil can be calculated according

Card 1/3

The Application of Two-dimensional Methods in Rheology

80292

S/170/60/003/04/25/027
B007/B102

to the position of the lines. Various varieties of this method are mentioned. They differ in the shape of the narrow slit. The variety with a slit like a narrow rectangle (Fig. 1) was described in the paper by B. Deryagin, G. Strakhovskiy, and D. Malysheva (Ref. 3). The variety with a narrow cuneiform slit and that with a plane parallel slit, when a flow in radial direction is present, permit the experimental determination of the dependence of the tangential tension on the velocity gradient and also of the limit shear strength if such is present. The theory of the first variety was worked out by M. M. Kusakov (Ref. 7). The last variant is one with a narrow rectangular slit and a temperature gradient across the blowing-off direction (Fig. 5). The second method, namely the one with the falling ball, permits the determination of oil viscosity at any temperature according to Stokes' law, of anomalies in oil viscosity and of the temperature, of the temperature dependence of the so-called "apparent" viscosity and of the dependence of the static limit shear strength. The papers by A. N. Kisilinskiy (Refs. 16, 17) are mentioned in this connection. If temperature is given, the third method makes it possible experimentally to determine the dependence of the deformation rate D on the shear strength τ or the dependence of the effective viscosity on the deformation rate. This method is applicable for lubricants which show only small thixotropic changes when

Card 2/3

The Application of Two-dimensional Methods in
Rheology

80292

S/170/60/C03/04/25/027
B007/B102

pressed through a capillary tube once. The papers by G. V. Vinogradov are mentioned, and the method based on using a capillary tube is described (Fig. 6). The automatic capillary viscometer AKV-2 by A. A. Konstantinov and G. V. Vinogradov is introduced in the USSR as a standard device for determinations of lubricant viscosity (Ref. 24). A somewhat altered variety of this device, namely the AKV-3-type, was recommended by V. Ratinov, A. Konstantinov, T. Rozenberg, G. Bogautinova, and G. Stalikova (Ref. 25) for measuring the plasticity of binding agents. This device was made the standard device for determining the normal viscosity of plaster for building purposes (Ref. 26). There are 6 figures and 26 Soviet references. W

ASSOCIATION: Institut neftekhimicheskogo sinteza, g. Moskva (Institute of Petroleum-chemical Synthesis, City of Moscow)

Card 3/3

85431

S/170/60/003/011/002/016
B019/B056

//1210

AUTHORS: Kussakov, M. M., Koshevnik A. Yu. Mikirov, A. Ye.

TITLE: Investigation of the State of Water in a Hydrocarbon Fuel
by Means of Light Scatter

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1960. Vol. 3, No. 11.
pp. 11-17

TEXT: On the basis of experimental results concerning the scattering of white light, the forming of micro-drops in a fuel of the type T-1 (T-1) in the case of a temperature decrease is investigated in the present paper. In the first part, the authors investigate the influence exerted by the drop dimensions upon light scatter by means of the Rayleigh equation. Next, the experimental set-up is described. The scattered light incides upon a rotating spirally perforated disk. The light passing through the perforation incides upon the cathode of a photomultiplier. Fig. 4 shows the scattering as a function of the angle for the fuel, which was saturated with water at 50°C (Curve 1) and at 20°C (Curve 2). Scattering was measured at 20°C. From the further considerations it follows that

Card 1/2

85431

Investigation of the State of Water in a Hydro- S/170/60/003/011/002/016
carbon Fuel by Means of Light Scatter B019/B056

if the fuel is cooled, microdrops of the order of 550 to 600 microns are formed and that they attain a concentration of several tens of millions per cubic centimeter. Further, the conclusion is drawn that with rapid cooling of a closed system, the excess of water is distributed uniformly over the emulsion phase and the walls of the container. There are 5 figures, 1 table, and 8 references: 4 Soviet, 1 German, and 3 US.

ASSOCIATION: Institut neftekhimicheskogo sinteza AN SSSR, g. Moskva
(Institute of Petroleum-chemical Synthesis, of the AS USSR,
Moscow)

SUBMITTED: February 4, 1960

Card 2/2

X

KUSAKOV, M.M.; LUEMAN, N.M.; SHCHUTSKO, M.I.

Investigating the state and distribution of water in fuel. Khim. i
tekh. topl. i masel 5 no. 8:63-66 Ag '60. (MIRA 13:8)

1. Institut neftekhimicheskogo sinteza AN SSSR.
(Liquid fuels) (Water)

SC/61-8-1-5/40

AUTHORS: Kudakov, M.M., Prokof'yeva, Ye.A. and Shishkina, M.V.

TITLE: Electronic Absorption Spectra¹ of Some Indan¹ Homologues

PERIODICAL: Optika i spektroskopiya, 1960, Vol 6, Nr 1, pp 27-35 (USSR)

ABSTRACT: The authors report their measurements of the electronic absorption spectra of indan and 15 of its derivatives. These spectra were obtained using a "Uvispek" spectrophotometer at wavelengths between 2200 and 2850 Å at room temperature. Among the indan derivatives there were ten monosubstituted, three disubstituted and two trisubstituted indans. The results are shown in Figs 1-6, in the form of $\log \epsilon(\lambda)$, where ϵ is the molar extinction coefficient. Positions of the absorption maxima and minima of these compounds are listed in Tables 1-4. The spectrum of each compound is discussed briefly. There are 6 figures, 4 tables and 32 references, 13 of which are Soviet, 14 English, 3 French and 2 German.

SUBMITTED: July 15, 1960

Card 1/1

KUSAKOV, M.M.; RAZUMOVSKAYA' E.A.; DEKARTOV, A.P.

Radioactive indicator study of the interaction between elemental
sulfur and thin copper films in a carbon medium. Zhur. prikl.
khim. 33 no.11:2466-2470 N '60. (MIRA 14:4)
(Sulfur—Isotopes) (Copper)

S/076/60/034/007/031/042/XX
B004/B068

AUTHORS: Kusakov, M. M. and Nekrasov, D. N.

TITLE: Capillary Hysteresis in Rising Liquids in Capillary Tubes
With Varying Cross Sections

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 7,
pp. 1602 - 1609

TEXT: The basic problem confronting the authors was the determination of the equilibrium point between water and petroleum in porous layers, making allowance for capillary hysteresis occurring in capillary tubes with variable cross sections. In this paper, capillary hysteresis in rising liquids is investigated in a capillary tube with sinusoidally increasing and decreasing circular cross section. Two calculation methods are given. 1) From the function $U = f(h)$ (3) (U - potential energy of gravity and surface tension; h - height of ascension of the liquid in the capillary tube), equilibrium values for h were calculated on the condition that $dU/dh = 0$ (4). The profile of the capillary tube was characterized by the following function: $r = \alpha + \beta \sin \gamma (h + \delta)$ (7),

Card 1/4

Capillary Hysteresis in Rising Liquids in S/076/60/034/007/031/042/XX
 Capillary Tubes With Varying Cross B004/B068
 Sections

with α , β , and γ being the constants of the capillary tube:
 $\alpha = 0.5(r_1 + r_2)$; $\beta = 0.5(r_1 - r_2)$; $\gamma = 2\pi/\lambda$; δ is the immersion depth
 of the capillary tube into the liquid; λ is the "period" of the capil-
 lary tube. The result of calculation is shown in Fig.2. h_1 , h_3 , h_5 cor-
 respond to a stable equilibrium, and h_2 , h_4 , h_6 to an unstable one. The
 transition of the meniscus from a stable equilibrium to the next higher
 one thus requires some energy to overcome the potential barrier. Ex-
 periments with water and oil in sine-shaped glass capillary tubes gave
 results in agreement with calculation. 2) From the shape of the capil-
 lary tube $r = f(h)$ (5), equilibrium values for h were calculated using
 the set of equations: $qgh = 2\sigma/r$; $r = \alpha + \beta \sin \gamma(h + \delta)$ (10). r is the
 radius of the capillary tube; σ is the surface tension on the liquid -
 air boundary; q is the density of the liquid; and g is the constant of
 gravity. Fig.5 shows the graphical solution of this set of equations by
 means of the functions $qgh = f(h)$ and $2\sigma/r = f(h)$. Also when this method
 was used, good agreement with experimental data was obtained.

Card 2/4

Capillary Hysteresis in Rising Liquids in S/G76/60/034/007/031/042/XX
Capillary Tubes With Varying Cross B004/B068
Sections

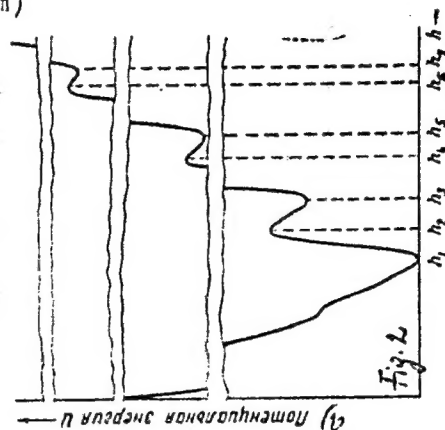
V. V. Lebedev is mentioned. There are 7 figures, 3 tables, and 6 references: 4 Soviet, 1 French, and 1 Czechoslovakian.

ASSOCIATION: Akademiya nauk SSSR, Institut nefti (Academy of Sciences USSR, Institute of Petroleum)

SUBMITTED: October 24, 1958

Legend to Fig.2:
a) Potential energy U.

Fig.2



Card 3/4